IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

KNORZER et al.

Application No. 10/009,636 Art Unit: 2834

Filed: December 14, 2001 Examiner: I. Mohandesi

For: ELECTRIC AXIAL FLOW MACHINE

PENDING CLAIMS AFTER AMENDMENTS MADE IN RESPONSE TO OFFICE ACTION DATED SEPTEMBER 13, 2002

1. An electric axial flow machine including an ironless disk-shaped rotor arranged on a machine shaft and having permanent magnets embedded in a fiber- or fabric-reinforced plastic, and, on both sides, next to the rotor, a stator, wherein the permanent magnets are each embedded in and joined at least peripherally to the fiber- or fabric-reinforced plastic so that the permanent magnets and the machine shaft form a dimensionally stable unit.

2. The electric axial flow machine as claimed in claim 1, wherein the permanent magnets are arranged circumferentially, in a circle, around the machine shaft and the fiber- or fabric-reinforced plastic extends between the permanent magnets over at least 10% of the circle.

3. The electric axial flow machine as claimed in claim 1, wherein the rotor has on an outer circumference, or proximate the outer circumference, a stiffening band comprising preimpregnated fibrous material, the rotor becoming thicker with increasing distance from the machine shaft.

4. The electric axial flow machine as claimed in claim 1, comprising means for determining magnetic pole position of the rotor including a magnetic strip arranged on an outer circumference of the rotor and having a radially magnetized series of magnetic poles arranged in correspondence to the permanent magnets embedded in the fiber- or fabric-reinforced plastic, and fixed-in-place Hall probes interacting with the magnetic poles.

5. The electric axial flow machine as claimed in claim 1, wherein the fiber- or fabric-reinforced plastic comprises an epoxy resin or an imide resin with glass fiber reinforcement.

6. The electric axial flow machine as claimed in claim 1, wherein the permanent magnets respectively comprise at least two separate magnet segments next to one another, in a circumferential direction, joined by a metal adhesive.

7. The electric axial flow machine as claimed in claim 1, wherein the stator comprises an annular yoke including slots extending approximately radially, relative to the machine shaft, and through which multi-phase windings pass.

8. The electric axial flow machine as claimed in claim 7, wherein the permanent magnets are obliquely arranged, relative to radii of the machine shaft, along a circumferential direction.

9. The electric axial flow machine as claimed in claim 1, including two stators electrically offset in relation to one another in a circumferential direction by 180° so that magnetic fluxes in the circumferential direction in the rotor are oppositely oriented and essentially cancel one another.

10. A method for producing an ironless disk-shaped rotor for arrangement on a machine shaft of an electric axial flow machine and having permanent magnets embedded in a fiber- or fabric-reinforced plastic, including placing the machine shaft and the permanent magnets in a mold, heating the mold, and injecting a pre-heated fiber- or fabric-reinforced plastic under pressure into the heated mold to embed the permanent magnets in the fiber- or fabric-reinforced plastic.

11. The method as claimed in claim 10, including injecting the fiber- or fabric-reinforced plastic at a temperature of at least 200°C and under a pressure of 500 - 1500 bar.

12. The electric axial flow machine as claimed in claim 7, wherein the slots are obliquely arranged, relative to radii of the machine shaft, along a circumferential direction.